

National Aeronautics and
Space Administration

GSDO-PLN-1129-ANX-01

REVISION A

RELEASE DATE: 03/02/2022

CROSS-PROGRAM

INTEGRATED LAUNCH OPERATIONS IMPLEMENTATION PLAN

ANNEX 01: LAUNCH CONTROL TEAM FIRING ROOM SEATING PLAN

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REVISION AND HISTORY PAGE

Status	Revision No.	Change No.	Description	Release Date
Baseline			Baseline (Approved at JICB, per GSDO-D0695-X, dated 05/26/2020) Prepared By: Jessica Parsons NASA NE-TE EGS	06/24/2020
Revision	A	GSDO-C1534-X	Revision A (Approved at JICB, per GSDO-D1534-X, dated 02/22/2022) Prepared By: Wes Mosedale Launch Director Tech. Assistant LX-O4 Change Summary: Seating updated to reflect current LCT/SLT seating approved by the Launch Director for Wet Dress Rehearsal and LCD. Firing room graphics updated to reflect current room configuration. Call Signs and Console Roles updated to align with GSDO-PLN-1192.	03/02/2022

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1.0 INTRODUCTION

Note: Exploration Systems Development Management Directive ESD-MD-12029, November 16, 2017, establishes the Exploration Ground Systems (EGS) Program name and retires the name Ground Systems Development and Operations (GSDO). There is no change in scope or architecture for EGS. Documentation may still contain references to GSDO until revisions are completed through normal updates. GSDO will remain as part of the document number.

1.1 PURPOSE

The Integrated Launch Operations Implementation Plan Annex 01: Launch Control Team (LCT) Firing Room Seating Plan documents the seating plan for the LCT by function.

1.2 SCOPE

This document contains the generic seating plan for the LCT by function only for Artemis I. It is not intended to record the final assigned and approved seating per mission.

1.3 CHANGE AUTHORITY/RESPONSIBILITY

Proposed changes to this document shall be submitted by an EGS Program Change Request (CR) to the Cross-Program Joint Integration Control Board (JICB) for consideration and disposition.

All such requests will adhere to the Configuration Management Change Process as defined in GSDO-PLN-1001, Exploration Ground Systems Program Information and Configuration Management Plan.

The appropriate National Aeronautics and Space Administration (NASA) Office of Primary Responsibility identified for this document is EGS.

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2.0 DOCUMENTS

2.1 APPLICABLE DOCUMENTS

The following documents include specifications, models, standards, guidelines, handbooks, and other special publications. The documents listed in this paragraph are applicable to the extent specified herein.

GSDO-PLN-1001 Exploration Ground Systems Program Information and Configuration Management Plan

2.2 REFERENCE DOCUMENTS

The following documents contain supplemental information to guide the user in the application of this document.

None

2.3 PARENT DOCUMENT

The following document is the higher-level specification, standard, guideline, handbook, special publication, or requirement document containing the requirement driving the creation of this document.

GSDO-PLN-1129 Cross-Program Integrated Launch Operations Implementation Plan

3.0 LCT SEATING PLAN

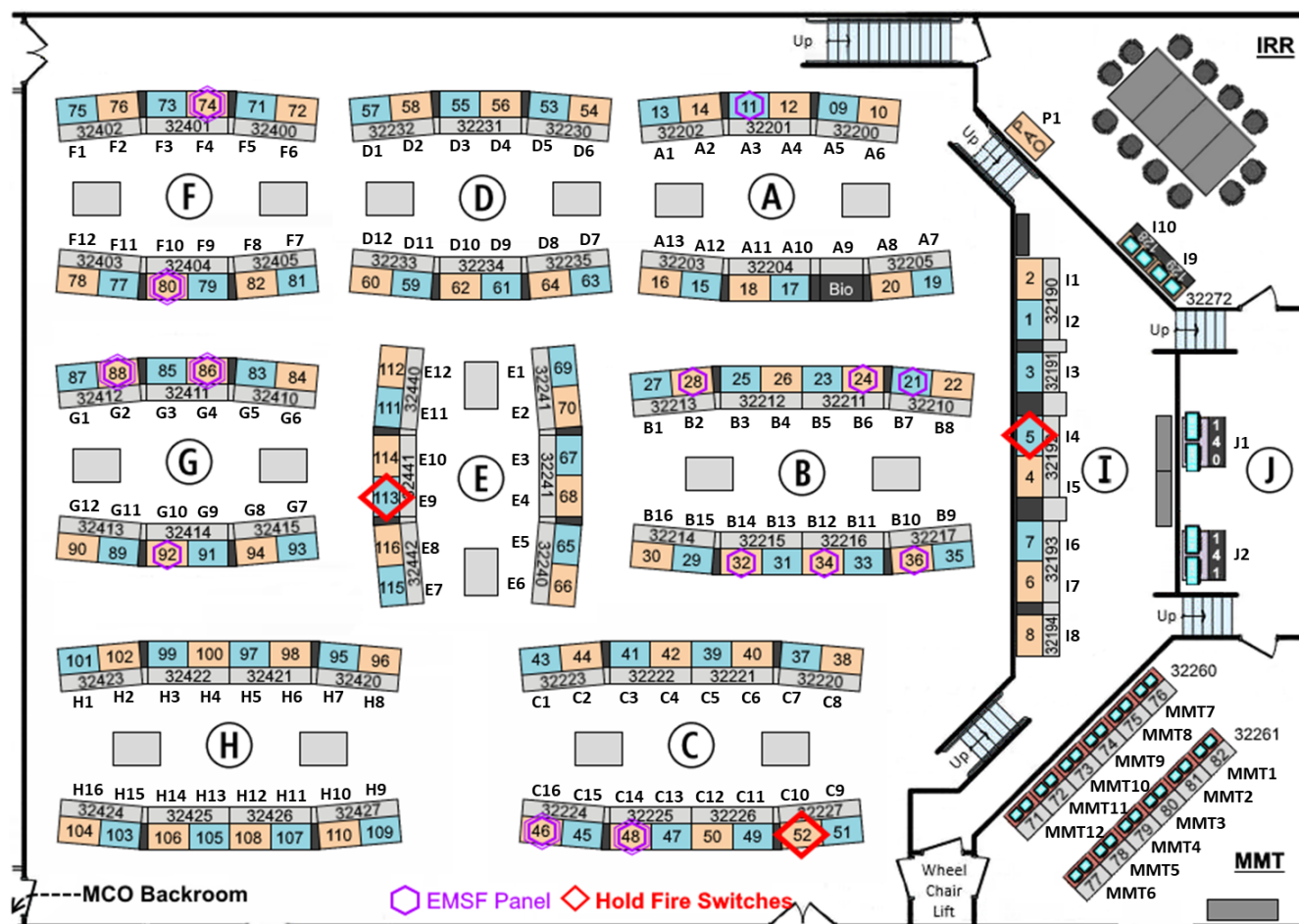
The following sections contain the floor layouts and the console assignments for the members supporting the LCT located within the Launch Control Center (LCC) at KSC. Members of the Support Launch Team (SLT) are also shown in Section 3.3 and 3.4 where they are seated in conjunction with the LCT members for a particular console. The Firing Room configuration and seating is controlled at the discretion of the Launch Director.

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3.1 FIRING ROOM 1 (FR1) - FLOOR PLAN



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3.1.1 FR1 - Assignments by Function

3.1.1.1 Console Group A

TABLE 1 CONSOLE GROUP A

Console #	Discipline/System	Call Sign	Role
A1	Mechanical	CAUM	Arms and Umbilicals Engineer (Core Stage Forward Skirt/Intertank Umbilicals, Tail Service Mast Umbilicals)
A2	Mechanical	CAUS	Arms and Umbilicals Engineer (Orion Service Module Umbilical, Interim Cryogenic Propulsion Stage Umbilical, Hydraulic Arms and Accessories Service Pressure Subsystem)
A3	Mechanical	CCAA	Crew Access Arm/Vehicle Stabilizer System Engineer
A4	UNASSIGNED	N/A	Hot Spare
A5	Test Conductors	AGTC	Assistant Ground Test Conductor
A6	Test Conductors	GTC	Ground Test Conductor
A7	Safety	SCC	Safety Console
A8	Safety	SCC	Safety Console
A9	Medical	CBSE	Biomedical System Engineer
A10	Medical	EMS	Emergency Medical Services (EMS) Coordinator
A11	Test Conductors	N/A	Hot Spare
A12	Mechanical	CGSS	Ignition Overpressure and Sound Suppression Engineer
A13	Mechanical	CMEC	Mechanisms

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3.1.1.2 Console Group B

TABLE 2 CONSOLE GROUP B

Console #	Discipline/System	Call Sign	Role
B1	Cryo/Prop	CMSS	Main Propulsion System (MPS) Specialist
B2	Cryo/Prop	CMPE	MPS Helium System Engineer
B3	Cryo/Prop	CMPS	MPS Engineer
B4	Cryo/Prop	TPRP	Core Stage Tank Propulsion Lead Engineer (LH2/LO2)
B5	Cryo/Prop	CLHY	Liquid Hydrogen (LH2) Engineer
B6	Cryo/Prop	CLHC	Core Stage Liquid Hydrogen (LH2) System Engineer
B7	Cryo/Prop	CLHU	Upper Stage Liquid Hydrogen (LH2) System Engineer
B8	Cryo/Prop	CLHF	Liquid Hydrogen Leak and Fire System Engineer
B9	Cryo/Prop	CLOP	Liquid Oxygen (LO2) Purges System Engineer
B10	Cryo/Prop	CLOU	Upper Stage Liquid Oxygen (LO2) System Engineer
B11	Cryo/Prop	CLOC	Core Stage Liquid Oxygen System Engineer
B12	Cryo/Prop	CLOX	Liquid Oxygen (LO2) System Engineer
B13	Cryo/Prop	CMPL	MPS LO2 System Engineer
B14	Cryo/Prop	CPRP	MPS/Engines Lead System Engineer
B15	Cryo/Prop	CSME	Core Stage Main Engines System Engineer
B16	Cryo/Prop	CUSE	Upper Stage Engine System Engineer

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3.1.1.3 Console Group C

TABLE 3 CONSOLE GROUP C

Console #	Discipline/System	Call Sign	Role
C1	Electrical	CEPO	Orion/Launch Abort System Electrical Power Systems (EPS) System Engineer
C2	Electrical	CEPO	Orion/Launch Abort System EPS System Engineer
C3	Electrical	CEPU	Upper Stage EPS Systems Engineer
C4	Electrical	CTCS	Thermal Control System Engineer
C5	UNASSIGNED	N/A	Hot Spare
C6	Avionics	CSEC	Core Stage Engine Controller System Engineer
C7	Avionics	CSEA	Engine Avionics System Specialist
C8	Avionics	CUEA	Upper Stage Engine Avionics System Engineer
C9	Flight Safety Systems (FSS)	CRSR	45 Space Launch Delta Range Safety Representative
C10	FSS	CRSR	45 Space Launch Delta Range Safety Representative
C11	FSS	CFTS	Flight Termination System System Engineer
C12	FSS	CFSS	FSS System Engineer
C13	Electrical	CEPS	EPS System Specialist
C14	Electrical	CEPB	Booster EPS Systems Engineer
C15	Electrical	CEPC	Core Stage EPS System Engineer (Batteries & Heaters)
C16	Electrical	CEPC	Core Stage EPS System Engineer - Power

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3.1.1.4 Console Group D

TABLE 4 CONSOLE GROUP D

Console #	Discipline/System	Call Sign	Role
D1	Hypers	CHYP	Orion Crew Module Hypergolic Propulsion Subsystem System Engineer
D2	Hypers	CHYP	Hypergolic Subsystem Lead / Upper Stage Hypergolic Propulsion System Engineer
D3	Hypers	CHYP	Orion Service Module Hypergolic Propulsion Subsystem System Engineer
D4	Mechanical	CECO	Orion Environmental Control Systems (ECS) System Engineer
D5	Mechanical	CECS	Space Launch System (SLS) ECS System Engineer - Local Console and Alarms monitoring
D6	Mechanical	CECS	SLS ECS System Engineer – Ground Support Equipment Control
D7	Haz Gas	CHGU	Hazardous Gas Leak Detection Subsystem (HGLDS) Operator 3 - Upper Stage
D8	Haz Gas	CHGD	HGLDS System Specialist
D9	Haz Gas	CHGI	HGLDS Operator 2 - Forward Skirt and Core Stage Intertank
D10	Haz Gas	CHGF	HGLDS Operator 1 - LH2 Tail Service Mast and Core Stage Engine Section
D11	UNASSIGNED	N/A	Hot Spare
D12	UNASSIGNED	N/A	Hot Spare

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3.1.1.5 Console Group E

TABLE 5 CONSOLE GROUP E

Console #	Discipline/System	Call Sign	Role
E1	Integration	TPE	Test Project Engineer (TPE)
E2	Integration	OPE	Operations Project Engineer – SLS Lead
E3	Integration	LPE	Launch Project Engineer
E4	Integration	LPE	LPE
E5	Integration	LPE	LPE
E6	Integration	TPE	Test Project Engineer
E7	Integration	OPE	Operations Project Engineer – Orion Backup
E8	Integration	CGLS	Ground Launch Sequencer (Backup)
E9	Integration	CGLS	Ground Launch Sequencer (Prime)
E10	Integration	CGLS	Ground Launch Sequencer (Support)
E11	Integration	TPE	Test Project Engineer
E12	Integration	OPE	Operations Project Engineer – Orion Lead

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3.1.1.6 Console Group F

Console Group F is configured as a spare console in the event another console group has to be relocated. For Artemis II and beyond it will be configured for payloads and/or future expansion. <TBD 3-1>

3.1.1.7 Console Group G

TABLE 6 CONSOLE GROUP G

Console #	Discipline/System	Call Sign	Role
G1	Environmental Controls & Life Support Systems (ECLSS)	CECL	ECLSS – Service Module Heater Engineer
G2	ECLSS	CECL	ECLSS – Crew Module Heater Engineer
G3	ECLSS	CECL	ECLSS – Launch Commit Criteria Engineer
G4	ECLSS	CECL	ECLSS – Lead Engineer
G5	ECLSS	CGCS	Ground Cooling System Engineer
G6	UNASSIGNED	N/A	Hot Spare
G7	UNASSIGNED	N/A	Hot Spare
G8	UNASSIGNED	N/A	Hot Spare
G9	Auxiliary Power Unit (APU)/Hydraulics (HYD)	CHYD	Core Stage HYD Engineer
G10	APU/HYD	CAPU	Core Stage (APU) System Engineer
G11	APU/HYD	CAHS	APU/HYD Specialist
G12	APU/HYD	CBHY	Booster APU & HYD Engineer

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3.1.1.8 Console Group H

TABLE 7 CONSOLE GROUP H

Console #	Discipline/System	Call Sign	Role
H1	Flight Controls	CSFC	Core Stage Flight Controls System Engineer
H2	Flight Controls	CFCE	Flight Controls System Expert
H3	Guidance, Navigation and Controls (GNC)	CSGN	Core Stage GNC System Engineer
H4	Flight Controls	CFCU	Upper Stage Flight Controls System Engineer
H5	UNASSIGNED	N/A	Hot Spare
H6	Communications & Tracking	CSSE	SLS Communications System Engineer
H7	Communications & Tracking	CVSE	Orion Communications and Video System Engineer
H8	Communications & Tracking	COSE	Orion Communications System Engineer
H9	Avionics	CAVS	SLS Avionics System Engineer
H10	Avionics	CAVS	SLS Avionics System Engineer
H11	Avionics	CAVU	Upper Stage Avionics System Engineer
H12	Avionics	CAVO	Orion Avionics System Engineer
H13	Avionics	CAVO	Orion Avionics System Engineer
H14	Flight Controls	COFC	Orion Flight Controls System Engineer
H15	GNC	CGNE	GNC System Specialist
H16	GNC	COGN	Orion GNC Systems Engineer

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3.1.1.9 Console Group I

TABLE 8 CONSOLE GROUP I

Console #	Discipline/System	Call Sign	Role
I1	Test Directors	STC	SLS Test Conductor
I2	Test Directors	ASTC	Assistant SLS Test Conductor
I3	Test Directors	NTD	NASA Test Director
I4	Test Directors	ANTD	Assistant NASA Test Director
I5	Test Directors	CNTD	Chief NASA Test Director
I6	Test Directors	OTC	Orion Test Conductor
I7	Test Directors	AOTC	Assistant Orion Test Conductor
I8	Test Directors	LRD	Landing & Recovery Director
I9	Launch Director	LD TA	Launch Director Technical Assistant
I10	UNASSIGNED	N/A	Hot Spare
P1	Public Affairs	PAO	Public Affairs

3.1.1.10 Console Group J

TABLE 9 CONSOLE GROUP J

Console #	Discipline/System	Call Sign	Role
J1	Launch Director	LD	Launch Director
J2	Launch Director	ALD	Assistant Launch Director

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3.2 MISSION MANAGEMENT TEAM SEATING

The Mission Management Team (MMT) will be located in the 3P4 area in Firing Room 1 (reference Figure 1), and the specific seating assignments are reflected in Table 10. The MMT Support Console (MSC) will be located on the LCC mezzanine between Firing Room (FR) 1 and FR2. Seating for MSC members will be provided on a temporary basis during launch activities in this location.

TABLE 10 3P4 MMT AREA

Console #	MMT Role
MMT1	Mission Manager
MMT2	ESD Cross-Program System Integration Director
MMT3	ESD Safety and Mission Assurance Director
MMT4	ESD Chief Safety and Mission Assurance Officer
MMT5	ESD Chief Engineer
MMT6	UNASSIGNED/Hot Spare
MMT7	EGS Program Manager
MMT8	SLS Program Manager
MMT9	Orion Program Manager
MMT10	Flight Operations Directorate Director
MMT11	Johnson Space Center Chief Medical Officer
MMT12	UNASSIGNED/Hot Spare

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3.3 LCC ROOM 3R18 LAYOUT

LCC Room 3R18 reflected in Figure 2 (below) holds the Kennedy Ground Control Subsystem (KGCS) and Ground Electrical Subsystems (GES) during Launch Countdown. Table 11 reflects console seating assignments.

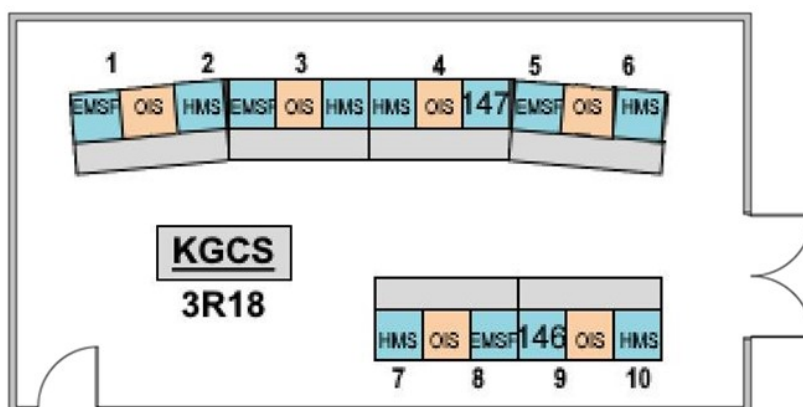


FIGURE 2 LCC ROOM 3R18 LAYOUT

TABLE 11 3R18 CONSOLE ASSIGNMENTS

Console #	Discipline/System	Call Sign	Role
1	Kennedy Ground Control Subsystem	KGCS	KGCS System Engineer (SLT)
2	Ground Electrical	JGEL	GES System Engineer (SLT)
3	Kennedy Ground Control Subsystem	KGCS	KGCS System Engineer (SLT)
4	Kennedy Ground Control Subsystem	KGCS	KGCS System Specialist (LCT)
5	Kennedy Ground Control Subsystem	KGCS	KGCS System Engineer (SLT)
6	Kennedy Ground Control Subsystem	KGCS	KGCS Primary System Engineer (LCT)
7	Ground Electrical	JGEL	GES System Specialist (LCT)
8	Ground Electrical	JGEL	GES System Engineer (SLT)
9	Ground Electrical	JGEL	GES System Engineer (SLT)
10	Ground Electrical	JGEL	GES Primary System Engineer (LCT)

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3.4 LCC ROOMS 3P11/3P12

Rooms 3P11 and 3P12 are adjacent to Firing Room 1 and 2 in the LCC, and host members of the Master Console Team, including the Master Console Operators (MCO), Launch Control System (LCS) Design Support, Operational External Enclave (OEE) and Triage for the LCT/SLT. 3P11 and 3P12 Layout is shown in Figure 3 below, and seating for those rooms is reflected in Table 10. Note that the seating shown is based off of a launch from the F1R LCS set; if the F1N LCS set is used for launch, the positions and console group “K” and “L” will be swapped.

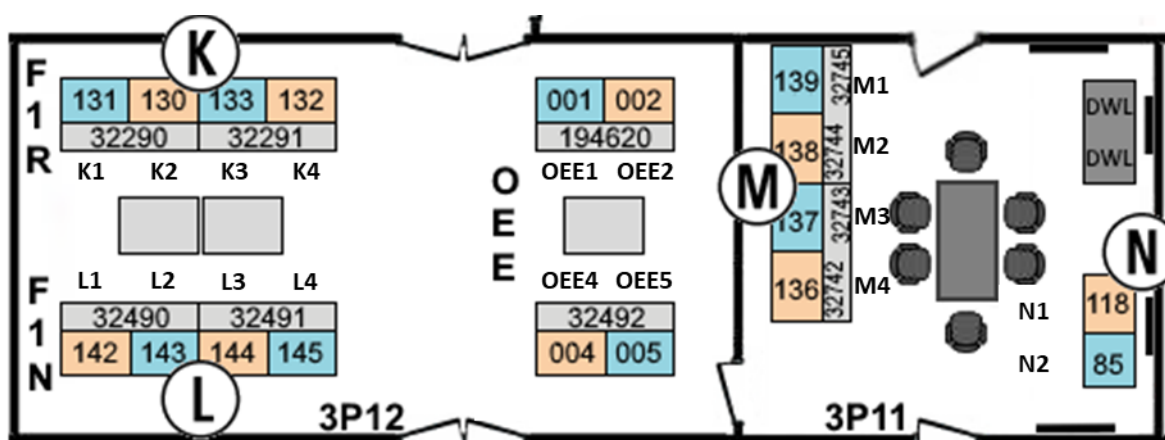


FIGURE 3 LCC ROOMS 3P11/3P12 SEATING PLAN – FLOOR PLAN

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TABLE 12 LCC ROOMS 3P11/3P12

Console #	Discipline	Call Sign	Role
K1	Master Console	MCO	Master Console Operator
K2	Master Console	MCO	Master Console Lead
K3	Master Console	MCO	Master Console Operator
K4	Master Console	MCO	Master Console Operator
L1	UNASSIGNED	N/A	Hot Spare
L2	Master Console	N/A	Triage (SLT)
L3	Master Console	N/A	Triage (SLT)
L4	Master Console	MCO	Master Console Operator Support (SLT)
OEE1	Master Console	OEE	Operational External Enclave
OEE2	UNASSIGNED		Hot Spare
OEE4	Master Console	CITS	Information Technology (IT) security
OEE5	Master Console	CITS	IT security
M1	Master Console	CE	Command/Control Chief Engineer
M2	Master Console	N/A	LCS Design Support
M3	Master Console	N/A	LCS Design Support
M4	Master Console	N/A	LCS Design Support
N1	Integration	N/A	Pseudo-CUI data to MSFC
N2	UNASSIGNED	N/A	UNASSIGNED

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APPENDIX A ACRONYMS AND ABBREVIATIONS

APU	Auxiliary Power Unit
CE	Change Evaluation
CR	Change Request
ECLSS	Environmental Control and Life Support System
ECS	Environmental Control System
EGS	Exploration Ground Systems
EMS	Emergency Medical Services
EPS	Electrical Power Systems
FR	Firing Room
FSS	Flight Safety System
GES	Ground Electrical Subsystems
GNC	Guidance Navigation and Control
GSDO	Ground Systems Development and Operations
HGLDS	Hazardous Gas Leak Detection Subsystem
HYD	Hydraulics
IT	Information Technology
JICB	Joint Integration Control Board
KGCS	Kennedy Ground Control Subsystem
LCC	Launch Control Center
LCS	Launch Control System
LCT	Launch Control Team
LPE	Launch Project Engineer
MCO	Master Console Operator
MMT	Mission Management Team
MPS	Main Propulsion System
NASA	National Aeronautics and Space Administration
NTD	NASA Test Director

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OPE Operations Project Engineer

SLS Space Launch System

SLT Support Launch Team

TBD To Be Determined

TBR To Be Resolved

TPE Test Project Engineer

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APPENDIX B OPEN WORK

B1.0 TO BE DETERMINED

Table B-1 lists the specific To Be Determined (TBD) items in the document that are not yet known. The TBD is inserted as a placeholder wherever the required data is needed and is formatted in bold type within brackets. The TBD item is numbered based on the section where the first occurrence of the item is located as the first digit and a consecutive number as the second digit (i.e., **<TBD 4-1>** is the first undetermined item assigned in Section 4 of the document). As each TBD is solved, the updated text is inserted in each place that the TBD appears in the document and the item is removed from this table. As new TBD items are assigned, they will be added to this list in accordance with the above described numbering scheme. Original TBDs will not be renumbered.

TABLE B-1 TO BE DETERMINED ITEMS

TBD	Section	Description
<TBD 3-1>	3.1.1.6	Determine configuration of Console Group F for Artemis II and beyond.

B2.0 TO BE RESOLVED

Table B-2 lists the specific To Be Resolved (TBR) issues in the document that are not yet known. The TBR is inserted as a placeholder wherever the required data is needed and is formatted in bold type within brackets. The TBR issue is numbered based on the section where the first occurrence of the issue is located as the first digit and a consecutive number as the second digit (i.e., **<TBR 4-1>** is the first unresolved issue assigned in Section 4 of the document). As each TBR is resolved, the updated text is inserted in each place that the TBR appears in the document and the issue is removed from this table. As new TBR issues are assigned, they will be added to this list in accordance with the above described numbering scheme. Original TBRs will not be renumbered.

TABLE B-2 TO BE RESOLVED ISSUES

TBR	Section	Description
None		

NOT EXPORT CONTROLLED

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B3.0 FORWARD WORK

Table B-3 lists the specific forward work items identified during this document's CR review and evaluation. Each item is given a sequential number (i.e., **<FWD 001>**) For each item, in the CR/CE field enter the specific number of the CR followed by the comment number from the Change Evaluation (CE) i.e., GSDO-C0345/CE-10, GSDO-C0345/CE-27. Do not include a placeholder for forward work items in the body of the document; list them only in Table B-3.

TABLE B-3 FORWARD WORK

FWD	CR/CE	Description
None		

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